



# WARREN HALL FLINTSHIRE GREAT CRESTED NEWT SURVEY

TEP Technical Report March 2019

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## 1.0 Summary

- 1.1 Seven ponds within 250m of the proposed development at Warren Hall, Broughton, Flintshire have been assessed for their suitability to support amphibians, in particular great crested newts (GCN).
- 1.2 Data searches, Habitat Suitability Assessments and environmental DNA (eDNA) sampling were carried out on one of the seven ponds at the Warren Hall site. Land owners of ponds 5 & 6 (P5 & P6) refused access to the ponds for surveys however, both ponds are stocked and commercially fished. P2 and P3 were dry upon inspection by surveyors. Pond 1 was unsuitable to eDNA due to it being over stocked with waterfowl which would affect the eDNA result. Pond 4 was large and most banks were unsuitable to access to sample for eDNA.
- 1.3 After consultations with Flintshire County Council Ecologist Amanda Davies, regarding newts in the wider area, it was revealed that an Eland Homes development to the south of the Warren Hall site (located south of Kinnerton Lane) is taking place without a European Protected Species (EPS) Licence. It is therefore assumed that there is no presence of GCN to the south of the development, P1 and P4 were assessed via HSI however no eDNA samples were taken.
- 1.4 Surveys were undertaken within the appropriate season and under the recommended conditions. Limitations to survey were minimal and overcome by the range of survey methods employed.
- 1.5 A HSI assessment of P7 indicated that the pond is considered average for its suitability to support breeding GCN. A negative eDNA sample result was returned.
- 1.6 No further amphibian surveys are required on P7. The negative eDNA result indicates breeding GCN are unlikely to be present in the pond. Some habitats on site have potential to support foraging and commuting amphibians.
- 1.7 No signs of great crested newts were recorded in any of the ponds surveyed at the Warren Hall site. Desktop records show that the closest historic records of GCN were found within Broughton 0.6km east of the site.
- 1.8 Common frog, smooth newt and palmate newt were also identified within desktop records, located off site between 0.6km – 1km to the east and south of the site boundary.
- 1.9 No further amphibian surveys are required at this time.

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## 2.0 Method

### Scope

- 2.1 TEP was commissioned by Welsh Assembly Government in April 2018 to undertake HSI and eDNA sampling of ponds within 250m of the proposed Warren Hall development site in Broughton, Flintshire.
- 2.2 The site (central grid reference SJ 32408 62514) is located east of Penymynydd, south of the A55 and Broughton. The site is immediately bounded to the north by the A5104, Kinnerton Lane to the west and south and Lesters Lane to the east. The site development boundary excludes the grounds of Warren Hall to the north and farmland surrounds the site borders on all aspects.
- 2.3 During 2018, a review of mapping and satellite imagery was undertaken to identify any ponds within the site or within the immediate surroundings. The review confirmed that the A5194 to the north may act as a barrier to amphibian dispersal within this area. Seven ponds were identified as requiring surveys. The location of these ponds, P1 – P7, is illustrated in Drawing G7016.012. Access was granted to P1 - P4 and P7. The landowners of P5 & P6 refused TEP access to survey the ponds however, TEP was informed by the landowner that both ponds are stocked and commercially fished.
- 2.4 The surveys are designed to determine whether or not great crested newts *Triturus cristatus* are breeding within the site or in ponds within ranging distance of the site. Where GCN are present survey effort is designed to allow population size class to be assessed. This information is required to inform development proposals including the design of any mitigation and consideration of any relevant legislation and policies. Although surveys target great crested newt other amphibian species will also be detected by the methods employed, these species if encountered are recorded and the results presented in this report.

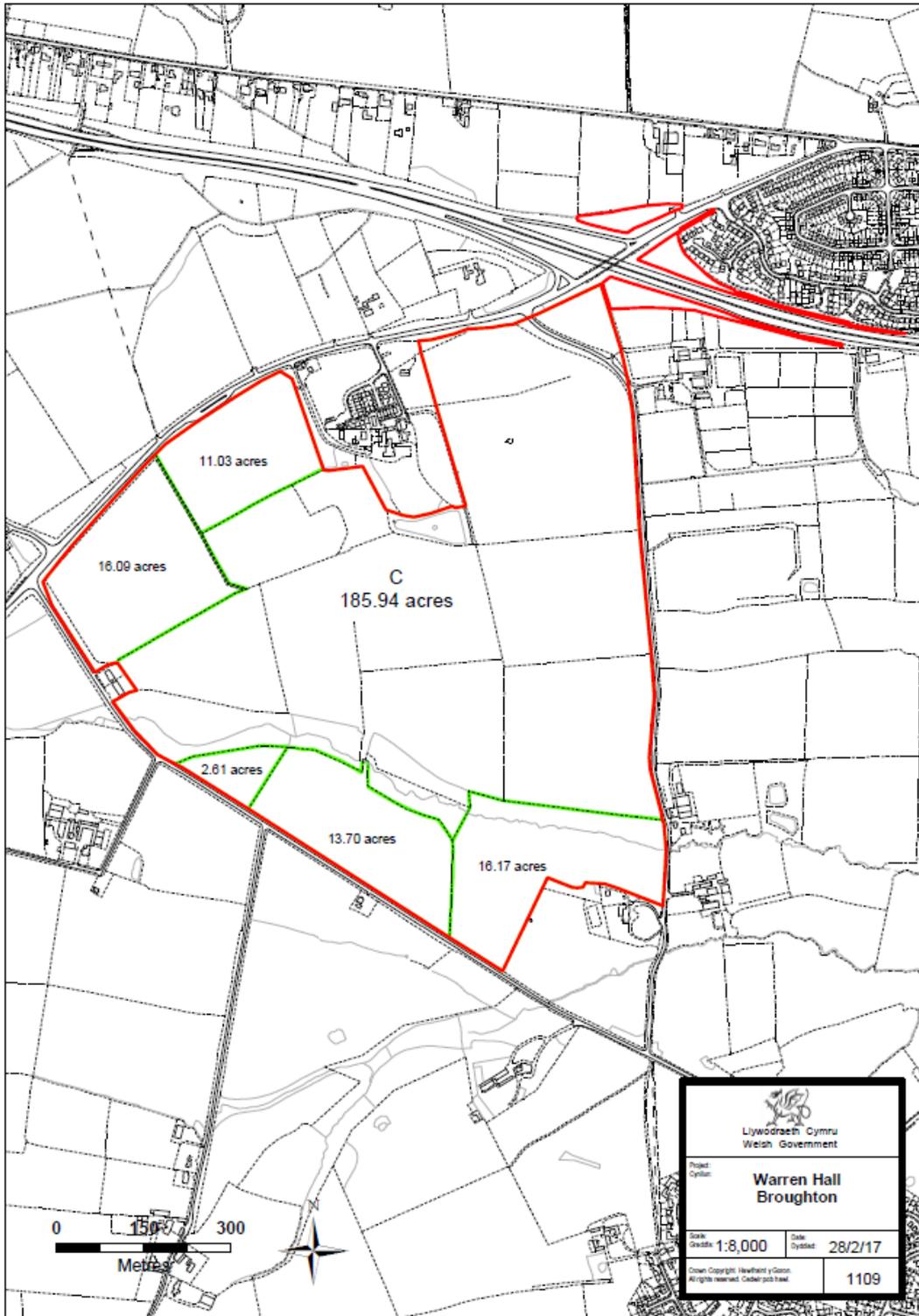


Figure 1: Site location and context.

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## Data Search

- 2.5 A 2018 web based search confirmed habitat within and adjacent to the site had the potential to support amphibians and that great crested newts (GCN) had historically been recorded approximately 0.6km east of site. A data request was submitted to COFNOD records centre in May 2018 to ascertain if any records of GCN are within the influence of the Warren Hall site. The search zone included the site and within 1km of the site boundaries.
- 2.6 No GCN records were discovered within 500m of the proposed development site boundaries during the data search. A population of GCN was discovered 0.6km east of the site boundary.

## Habitat Suitability Index (HSI) Assessments

- 2.7 HSI surveys were undertaken at three of the seven ponds, where access had been granted. No access was granted to P5 & P6 and P2 & P3 were discovered to be dry upon visiting site. HSI surveys were undertaken on 20<sup>th</sup> June 2018.
- 2.8 HSI<sup>1</sup> is a standard measure of calculating the suitability of a pond to support breeding great crested newts, based on an assessment of ten characteristics (indices), including size, shading, depth and vegetation profile. The assessment generates a number between 0 and 1 for each of the indices which are combined to provide an overall assessment of a pond's suitability to support GCN on a categorical scale (**Table 1**). The assessment has not been designed for or tested on other waterbodies such as ditches.

*Table 1: Pond habitat suitability index scoring*

HSI Score	Suitability	Predicted GCN Occupancy of Ponds in each Category
< 0.5	poor	3%
0.5 to 0.59	below average	20%
0.6 to 0.69	average	55%
0.7 to 0.79	good	79%
> 0.8	excellent	93%

### Qualifications

- 2.9 HSI surveys were undertaken by Clare Gower who has held a Natural England/Natural Resources Wales GCN survey licence since 2016.

1: ARG UK Advice Note 5 (May 2010) Great Crested Newt Habitat Suitability Index

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## eDNA

- 2.10 Environmental DNA (eDNA) sampling was undertaken at P7 on 20<sup>th</sup> June 2018. Ponds P2 & P3 and P5 & P6 were not suitable for this survey method due to lack of water and restricted access to ponds respectively. eDNA samples of P1 and P4 were not taken as talks with Flintshire County Council Ecologist Amanda Davies confirmed that Eland Homes developments to the south of Kinnerton Lane are being undertaken without the need of a EPS licence and absence of GCN evidence is assumed.
- 2.11 Sample collection was undertaken by TEP. Sample kits and analysis was provided by FERA. Both TEP and FERA followed the relevant sections of the method set out in the DEFRA funded study endorsed by Natural England<sup>2</sup>. In summary the sampling protocol is as follows:
- 20 samples were taken from around the entire perimeter of the waterbody.
  - The surveyor stayed out of the water while taking the samples (extension poles were used in situations where open/sufficiently deep water was at a distance from the dry banks.
  - Survey locations were distributed around the pond perimeter but micro-siting was used to select locations most likely to be used by GCN.
  - At each sample location the water column was stirred prior to taking the sample but care was taken to avoid disturbing the sediment on the base of the pond.
  - Once all 20 samples were taken, 15ml of the total sample were pipetted into each of the 6 sampling tubes, whilst ensuring that the water in the sample bag was mixed before taking each 15ml sample and that only one sample tube was opened at any one time.
  - At all times the surveyor ensured that the risk of contaminating the sampling equipment was minimised by avoiding the placement of the ladle or pipette on the ground or on any otherwise potentially contaminated surfaces and by changing gloves between the initial sampling stage and the pipetting stages of the method.

### Chain of custody

- 2.12 On receipt from FERA the sampling kits were registered on a central database using the unique bar codes. Immediately prior to survey, sampling kits were issued to surveyors with individual Sample Forms using the unique bar code as identification. The site name and date of issue was also recorded on this form (and on the central database). Once in the field and at the ponds, the surveyor confirmed that the appropriate field survey sheet was being completed by checking the bar code on the box and double checking the corresponding bar codes on the sample tubes. The surveyor then filled in the date of survey and the pond ID number (as well as other information relating to survey conditions) on the Sample Form.

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2: Biggs et al 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford

- 2.13 On returning to the office the Sample Forms were signed to confirm for each sample who received the samples and checked them into the fridge and the temperature of the fridge. The pond IDs on each form were checked against a site map confirming which ponds had been sampled and this map was stored with the Sample Forms. All this information was also recorded on the central database. The sample preserving tubes were stored in a fridge until the morning of collection by the courier. The Sample Forms and the central database were updated to confirm the date of collection by the courier.
- 2.14 The unique bar codes were used by FERA to report results. All results were recorded in the central database by one member of staff and cross checked by a second member of staff before issuing to the project leader for review.

#### Qualifications

- 2.15 TEP Associate Director (Ecology) Elizabeth Seal underwent training on the eDNA sampling method with Dr Jeremy Biggs of the Freshwater Habitats Trust<sup>3</sup> on 11th April 2014. A copy of the certificate of this training can be provided on request. Following this Elizabeth devised a TEP internal training course covering theoretical and field based modules on eDNA sampling method, biosecurity measures and record keeping procedures. Only those TEP ecologists with GCN survey licences who have successfully undertaken this course are tasked with eDNA sampling.

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3: Dr Briggs authored the 2014 DEFRA funded report on the eDNA survey method for great crested newts.

### 3.0 Results

#### Habitat Suitability Index (HSI) Assessments

- 3.1 Pond descriptions and photographs are provided in **Table 2** and the results of the HSI surveys are presented in **Table 3**.
- 3.2 The suitability of ponds within and surrounding the site to support GCN ranged from Poor to Average.
- 3.3 Ponds P1 received a Poor HSI score. P4 and P7 received an Average HSI score. A review of the ponds identified any overriding reasons (such as pollution or absence of egg laying material or use as a highly stocked commercial fishing pond) that would prevent GCN from breeding within the pond/ponds. This is described within Table 2.

*Table 2: Pond description and photos*

Pond	Description & grid reference	Photograph
P1	SJ3194462103  P1 is a large duck breeding pond, nesting boxes for ducks are positioned around the pond boundaries. The water quality was low with no submerged or emerging vegetation present.	

Pond	Description & grid reference	Photograph
P4	<p>SJ 324576187</p> <p>P4 is a large fishing lake with regular fishing platforms positioned along the margins. The presence of fish may discourage any newts from using P4 as a breeding pond.</p>	
P7	<p>SJ 3248262687</p> <p>P7 is a large pond surrounded by a mix of conifer and broadleaved trees, shading 90% of the water surface. Canada geese were present at the time of survey. Dense vegetation was present on some banks providing some shelter and foraging habitat for newts.</p>	



Table 3: HSI assessment results

Pond Ref	SI1 Location		SI2 Pond Area		SI3 Permanence		SI4 Water Quality		SI5 Shade		SI6 Waterfowl		SI7 Fish		SI8 Pond Density		SI9 Terrestrial Habitat		SI10 Macrophyte Cover		Overall HSI	
	Measure	Score	Measure	Score	Measure	Score	Measure	Score	Measure	Score	Measure	Score	Measure	Score	Measure	Score	Measure	Score	Measure	Score	HSI	Suitability
P1	A	1	650	1	Never	0.9	Poor	0.33	20	1	Major	0.01	Possible	0.67	1.59	0.76	Moderate	0.67	0	0.3	<b>0.44</b>	<b>Poor</b>
P4	A	1	4100	0	Never	0.9	Moderate	0.67	95	0.3	Minor	0.67	Minor	0.33	1.59	0.76	Good	1	5	0.35	<b>0.60</b>	<b>Average</b>
P7	A	1	3500	0	Never	0.9	Moderate	0.67	90	0.4	Minor	0.67	Possible	0.67	1.59	0.76	Moderate	0.67	5	0.35	<b>0.64</b>	<b>Average</b>

## eDNA

3.4 The results of the eDNA surveys are presented in **Table 4**. No great crested newt eDNA was identified in P7 during these surveys.

*Table 4: eDNA survey results*

Pond Ref	Survey Date	Surveyor	Score	GCN Present? (Y/N)
P7	20 <sup>th</sup> June 2018	Clare Gower	0/12	N

## Results Summary

3.5 Table 5 summarises the HSI and eDNA survey results.

*Table 5: Summary of pond survey results*

TEP Pond Ref	HSI Category	GCN (eDNA)
P1	Poor	N/A
P4	Average	N/A
P7	Average	Negative (0/12)

## 5.0 Meta Population

### Meta Population Assessment

- 5.1 Great crested newts often exist as a series interlinked subpopulations where individuals disperse between a cluster of ponds. This system is called a meta population. Small, isolated populations based on a single pond are normally less likely to persist in the long term. As such, impacts on a single pond may have knock-on effects on newts in nearby ponds. Studies reveal variation in dispersal distances, but great crested newts commonly move between ponds that are within around 250m of each other.
- 5.2 No meta population has been identified within the influence of the site.

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## 6.0 Evaluation and Recommendations

### Additional Surveys

- 6.1 There are currently no additional survey requirements. Survey scope and timing is sufficient to inform development proposals and review legal and policy requirements. eDNA surveys have confirmed great crested newts are absent from the pond (P7) onsite.
- 6.2 P2 & P3 south of the development boundary are dry and present no habitats to support a GCN population. P5 & P6 are stocked with fish and fished commercially – the presence of GCN is highly unlikely within these ponds. P1 scored Poor within the HSI assessment, P4 scored Average. Both ponds are south of the Warren Hall development site and close to the Eland Homes development site which is currently ongoing without an EPS licence. It is therefore considered unlikely for GCN to be present within these ponds.
- 6.3 Great crested newt surveys are valid for at least 2 years and potentially 4 years or more depending on the specific use of the data, local conditions and the potential impact predicted on GCN. When data is greater than 2 years old advice should be sought from an appropriately experienced ecologist.

### Licensing / Reasonable Avoidance Measures

- 6.4 No great crested newts have been recorded either on site or within influence of the site. There are no licensing requirements or restrictions to works commencing on site in relation to this species.



## **DRAWINGS**

- Pond Locations (G7016.012)



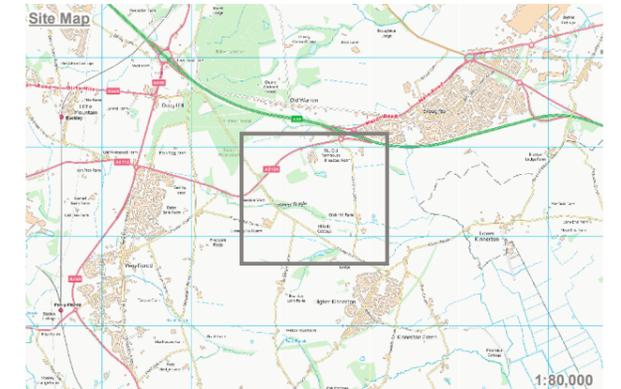
**KEY**

- Survey Boundary
- Surveyed Ponds**
- Pond
- Dry Pond



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Rev	Description	Drawn	Approved	Date



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Project  
**Warren Hall Phase 1 and Phase 2 Ecology Survey**

Title  
**Pond Locations**

Drawing Number  
**G7016.012**

Drawn	Checked	Approved	Scale	Date
CR	JS	JC	1:5,500 @ A3	25/01/2019



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